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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,639	04/16/2001	Kenichiro Sato	Q63941	3676

7590

11/03/2003

SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 11/03/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

C10-12

Office Action Summary

Application No.

09/834,639

Applicant(s)

SATO ET AL.

Examiner

Yvette C. Thornton

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 1-3, 7-12 and 16-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 4-6, 13-15, 19 and 21 is/are rejected.
- 7) ☒ Claim(s) 20 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This is written in reference to application number 09/834639 filed on April 16, 2001 and published as US 2002/0009666 on November 22, 2001.

Information Disclosure Statement

1. The Information Disclosure Statement filed on September 2, 2003 has been entered and fully considered.

Oath/Declaration

2. The examiner acknowledges the declaration submitted pursuant to 37 CFR 1.132 by inventor Kenichiro Sato on September 2, 2003.

Request for Continued Examination (RCE)

3. The request filed on September 2, 2003 for a Request for Continued Examination (RCE) under 37 CFR 1.53(d) based on parent Application No. 09/834639 is acceptable and a RCE has been established. An action on the RCE follows.

Response to Amendment

4. The amendments to the specification have been entered and fully considered. The examiner has found no evidence of new matter.
5. Claims 1-3, 7-12 and 16-18 have been withdrawn from consideration without traverse (Paper No. 6). Claims 1-22 are currently pending.

Claim Rejections - 35 USC § 102

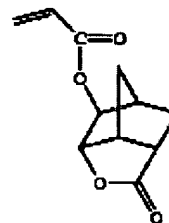
6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 4-5, 13-15, 19 and 21 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Uetani et al. (US 6,579,659 B2). Uetani exemplifies the synthesis of a resin(A2) comprising 2-ethyl-2-adamantyl methacrylate, 5-acryloyloxy-2,6-norbornanecarbolactone, 2-norbornene and maleic anhydride (c. 10, l. 35-57). It is the examiner's position that 2-ethyl-2-methacrylate meets the limitations of claimed formula (NII) wherein A is a single bond; W represents $-C(R_{na})(R_{nb})(R_{nc})$ where R_{na} and R_{nb} combine to form an alicyclic ring and R_{nc} is an alkyl group having 2 carbon atoms. The said



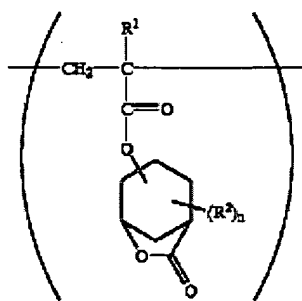
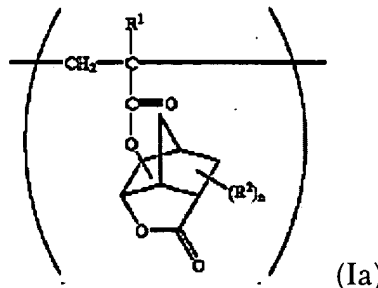
unit 5-acryloyloxy-2,6-norbornanecarbolactone having the structure: meets the limitations of the claimed repeating unit having a group represented by formula (I-1). 2-norbornene meets the limitations of claimed formula (I) wherein R_{n1-4} are each hydrogen. Maleic anhydride meets the limitations of claimed formula (NIII) wherein Z is $-O-$. The said resin has a molar ratio of 2:2:3:3 and a molecular weight of 9,230.

Uetani further exemplifies a resist composition comprising the said resin A2, an acid generating agent, a quencher and a solvent mixture (c. 15, l. 40-c/ 17, l. 54; Table 1).

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Although not exemplified, Uetani clearly anticipates a resin having at least one

polymeric unit represented by formula (Ia) and (Ib):



(Ib) (see abstract). Formula (Ib) meets the limitations of claimed

formula (1-3). One of ordinary skill would readily envisage a resin similar to that exemplified as resin A2 wherein formula (Ib) is used instead of formula (Ia)

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

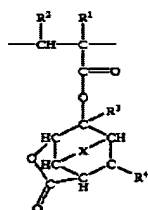
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Uetani et al. (US 6579659 B2) as applied to claims 4-5, 13-15, 19 and 21 above, and further in view of Takahashi et al. (US 5478869 A). Uetani teaches all the limitations of the instant claims as discussed above, except it fails to explicitly discuss the use of fluorine-type or silicon

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surfactant as set forth in instant claim 6. Uetani does teach that the taught composition may contain various additives such as dissolution inhibitors, surfactants, stabilizers and dyes (c. 9, l. 2-5). The examiner is of the position that silicon-type and fluorine-type surfactants are well known and conventional in the art. This position is supported by the teachings of Takahashi which discloses that it is generally known that a silicone-type surfactant or a fluorine-type surfactant is used for the purposes of imparting a uniform coating property and preventing formation of coating film defects (c. 3, l. 58-65). One of ordinary skill in the art would have been motivated to use a silicone-type or fluorine-type surfactant as the taught surfactant of Uetani in order to improve the coating properties of the taught composition.

10. Claims 4-6, 13-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US 6280898 B1). Hasegawa teaches a lactone containing polymer, which is used as a base resin to formulate a resist composition having high sensitivity, resolution and etching resistance. The second aspect of the taught invention provides for a polymer comprising units of general formula (1a) and having a weight average molecular



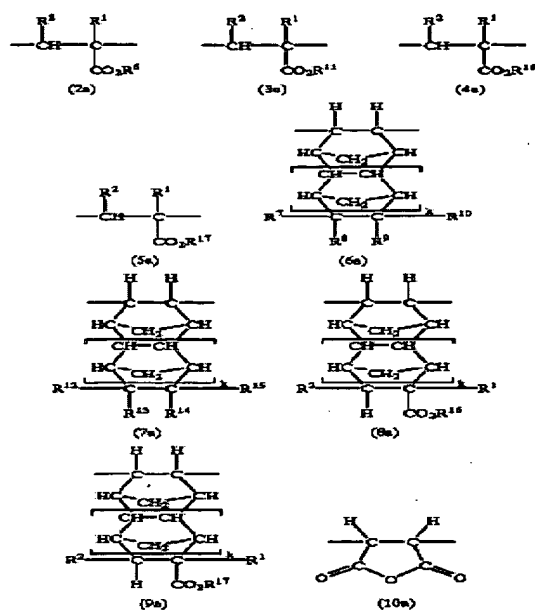
weight of 1,000 to 500,000

(1a) wherein R1 is a hydrogen, methyl or

CH₂CO₂R₅; R₂ is hydrogen, methyl or CO₂R₅; R₃ is a straight, branched or cyclic alkyl group having 1-8 carbon atoms; R₄ is hydrogen or CO₂R₅; R₅ is a straight, branched or cyclic alkyl group having 1-15 carbon atoms; X is CH₂, CH₂CH₂, O or S (c. 2, l. 17-65).

The polymer may further include units of at least one of general formulae (2a) to (10a).

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(c. 2, l. 66-c. 4, l. 10). In preparing the polymer of

the invention, the proportions of the respective monomers are properly adjusted so as to produce a polymer, which will exert the desired performance when formulated as a resist composition. If desired the polymer can be prepared by copolymerizing (i) the first monomer of formula (1) with (ii) at least one second monomer of formula (2a) to (10a) and further with (iii) a third monomer having a carbon-to-carbon double bond. Examples include methyl methacrylate, maleic acid, norbornene and itaconic anhydride (c. 14, l. 40-60). Preferably the monomer contains 1-70 mol% of formula (1); 1-95 mol% of at least one of formula (2) to (10) and 0-70 mol% of the third monomer. The polymers of the invention have a weight average molecular weight of about 1,000 to 500,000 (c. 14, l. 61-c. 15, l. 12). It is the examiner's position that general formula (1) meets the limitations of a group having claimed formula (I-1); taught formula 10 meets the limitation of claimed formula (NIII) of instant claims 5; and formula (2-5) meet the limitation of claimed formula (NII). Furthermore,

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when the taught third monomer is norbornene the limitations of claimed formula (I) are meet.

The taught resist composition comprises the said polymer as the base resin, an acid generator and a solvent (c. 15, l. 42-49). A basic compound may be blended into the taught composition to suppress the rate of diffusion of the acid generated by the photoacid generator within the resist film (c. 26, l. 56-c. 27, l. 8). The basic compound is formulated in an amount of about 0.001 to 10 parts per part of the photoacid generator (c. 29, l. 41-45). The resist composition may also include, as an optional ingredient, a surfactant, which is commonly used for improving the coating characteristics. Examples include FLORADE FC-430 and FC-431; SURFLON S-141, and MEGAFACE F-8151, which are fluorine-type and silicon-type surfactants (c. 35, l. 1-18).

Hasegawa fails to exemplify a polymer of the instant claims however, one of ordinary skill in the art would have been motivated by the teachings of the prior art to form a polymer comprising a polymer having a unit of general formula (1a), a unit of any of the taught formula (2a) to (10a) and a norbornene unit (i.e., third monomer). Specifically when the polymer has units of formula 1a, (2a), (3a) or (4a), and 10a in combination with a norbornene unit, the limitations of the instant claims are met. One of ordinary skill would have been further motivated by Hasegawa to admix the said polymer with (B) a photoacid generator (C) a basic compound and (D) a surfactant in order to formulate a resist composition having a high sensitivity, resolution and etching resistance.

Response to Arguments

11. Applicant's arguments filed September 3, 2003 have been fully considered but they are not persuasive. Applicants argue that the prior reference to Hasegawa et al. fails to render obvious the claimed invention. Applicants submit declaration evidence in an attempt to show unexpected improvements over the prior art. The examiner has fully considered the said declaration evidence and found it to be unconvincing. The declaration compares inventive resins 1-3 and 9 to polymers 34 and 35 of the prior art. The examiner has reviewed the presented declaration and believes that it is not commensurate in scope with the independent claim of the present invention. Claim 4 as written fails to require the presence of a surfactant. The prior art reference to Hasegawa also fails to exemplify a surfactant. The examiner is aware that the depending claim 6 introduces a silicon-type or fluorine-type surfactant into the claimed composition. However, the examiner is of the position that the surfactant is a preferred embodiment. It is the examiner's belief that the preferred embodiment may result in enhanced results and should not be used in comparison with the closest prior art. The examiner suggests presented data without the use of the surfactant.

12. Furthermore, the declaration fails to compare the broadest scope of the claimed invention as set forth in claim 6. The said claim set forth in the use of (C) an organic basic compound and (D) a fluorine-type and/or silicon-type surfactant. It is unclear why a fluorine containing surfactant was chosen over a silicon containing surfactant and why the organic compound is absent.

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13. The examiner hereby withdraws the rejection of the claims 20-22 over Hasegawa.

The examiner re-considered her position and agrees with the applicant that claims 20-22 do require the presence of claimed formula (I-2), (I-3) and (I-4) respectively.

Allowable Subject Matter

14. Claims 20 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: review of the prior art failed to teach and/or suggest the claimed invention of instant claim 4 comprising a resin having a repeating unit of formula (I), a repeating unit of formula (NII) and a repeating unit having a group represented by formula (I-2) or (I-4).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

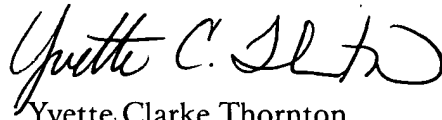
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.

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A handwritten signature in black ink, appearing to read "Yvette C. Thornton". The signature is fluid and cursive, with the first name "Yvette" being more prominent.

Yvette Clarke Thornton

Junior Examiner

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yct

October 29, 2003